

**What is claimed is:**

1. A composition comprising colloidal  $\text{Fe}_3\text{O}_4$  particles coated with a biotin-binding protein.
2. A composition as claimed in claim 1 wherein the biotin-binding protein is avidin or streptavidin.
3. A composition as claimed in claim 2 wherein the biotin-binding protein is streptavidin.
4. A method for synthesis of a composition as claimed in claim 3, said method comprising the steps of incubating colloidal  $\text{Fe}_3\text{O}_4$  particles with a biotin-binding protein.
5. A method as claimed in claim 4, further comprising the steps of:
  - a) forming colloidal  $\text{Fe}_3\text{O}_4$  particles by mixing aqueous  $\text{FeCl}_2$  with aqueous  $\text{FeCl}_3$  and adding aliquots of the mixture to an alkaline solution;
  - b) adding a biotin-binding protein.
6. A method as claimed in claim 5, wherein the molar ratio of  $\text{FeCl}_2$ :  $\text{FeCl}_3$  is between 1:1.5 and 1:2.
7. A method as claimed in claim 6, wherein the molar ratio of  $\text{FeCl}_2$ :  $\text{FeCl}_3$  is 1:1.5.
8. A method as claimed in claim 7, wherein the aqueous  $\text{FeCl}_2$  is  $\text{FeCl}_2 \cdot 4\text{H}_2\text{O}$ .
9. A method as claimed in claim 8, wherein the aqueous  $\text{FeCl}_3$  is  $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$ .
10. A method as claimed in claim 9, wherein said forming step further includes adding an ammonia solution to the mixture of  $\text{FeCl}_2$  and  $\text{FeCl}_3$ .

11. A method as claimed in claim 10, wherein the biotin-binding protein is added in excess.

5 12. A method as claimed in claim 11, wherein the biotin-binding protein is streptavidin.

13. A method of immobilising a biotinylated compound comprising incubating said biotinylated compound in solution in the presence of a composition as claimed in claim 1.

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14. A method as claimed in claim 13, wherein the biotinylated compound is selected from the group consisting of a nucleic acid molecule, a protein, and a peptide.

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15. A method as claimed in claim 14, further comprising the step of separating the biotinylated compound and the composition from said solution.

16. A method as claimed in claim 15, wherein said separating step further comprises the step of magnetically attracting the biotinylated compound and the composition to a surface.